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For too long, there has been widespread acceptance of the idea that injuries are just "accidents"—random acts of fate or the result of individual carelessness, rather than a phenomena to be understood and prevented. Research and experience show that, in fact, many injuries are completely preventable. Injuries—the human suffering they cause, and the great financial costs that come with them—should be recognized as a priority public health problem to be solved.

Nearly 300 Vermonters lose their lives to injuries each year, and thousands more suffer serious, sometimes permanent, disabilities as a result of their injuries. Injury—not disease—is the leading killer of our children, adolescents, and young adults. Both intentional and unintentional injuries rank among the top 10 leading causes of death for every age group. Overall, unintentional injuries are the fifth leading cause of death; suicide is the eighth.

As with any other public health issue, the first step is to identify and quantify the problem. In October 1999, the Vermont Department of Health was awarded a five-year grant from the Centers for Disease Control & Prevention to focus public attention and prevention efforts on the problem of injury. The Vermont Injury Prevention Advisory Committee was formed in 2000 to help guide the department in forming an action plan—the *Vermont Injury Prevention Plan* is the result of this effort.

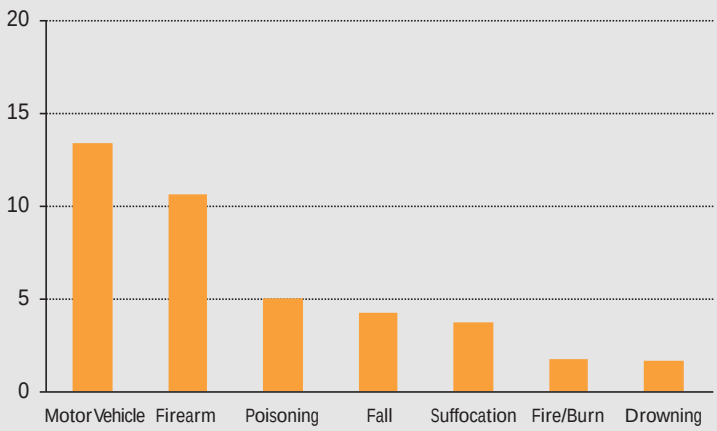
introduction

The Causes of Injury

The leading causes of injury death have not changed much in recent times. The biggest culprits by far are motor vehicles and firearms. Death rates from injury are higher for males than for females, and this gender difference increases with age, perhaps reflecting the greater likelihood of males to particpate in risk-taking activities.

When it comes to non-fatal injuries, the picture is slightly different. Although most non-fatal injuries are of minor severity, and result in no more than a day or two of restricted activity, a large number result in fractures, brain injuries, major burns or other significant disability. For every injury death, there are 18 hospitalizations. Falls are overwhelmingly the leading cause of injury-related hospitalizations, followed by motor vehicle crashes and poisoning.

Leading Causes of Injury Death
Per 100,000 Vermonters (1990-2000)



Unintentional Injuries

Unintentional injuries comprise the largest portion of injury-related deaths. Of these, approximately 37 percent result from motor vehicle crashes. The next highest category, "other," covers a wide range of causes, none of which in itself constitutes a major category of unintentional injury. These include machinery, natural environmental, bites and stings, overexertion, etc.

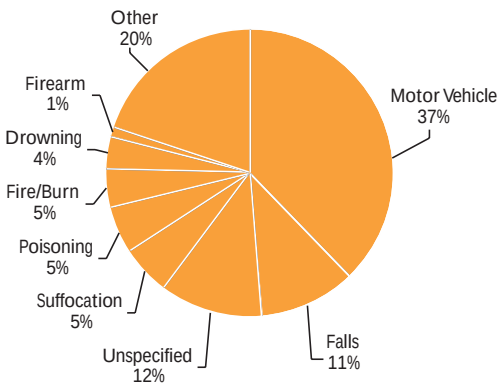
The Role of Alcohol

Alcohol is a risk or a contributing factor in almost every category of injury, both intentional and unintentional. Between 30 and 40 people die each year on Vermont's highways in alcohol-related crashes. Alcohol use has also been linked to a substantial portion of the injuries and deaths resulting from falls, fires, and drowning. It also contributes to the incidence of homicide, suicide, and domestic and child abuse/neglect.

The Cost Benefit of Preventing Injuries

The greatest cost of injury is measured in human suffering and loss. At the same time, the financial repercussions are staggering. In the U.S., more than $224 billion is spent annually on medical care, rehabilitation, and lost income and productivity resulting from injuries.

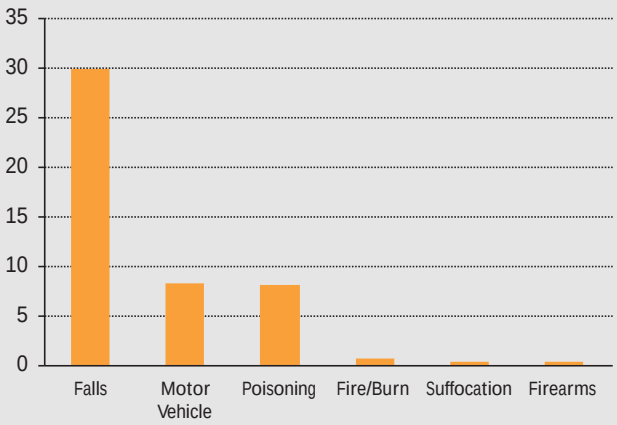
Unintentional Injury Deaths
Percentage of Vermont injury deaths (1990-2000)



Hospital discharge data give a partial picture of the larger costs of Vermont's leading causes of injury. These charges, great as they are, are still imprecise and do not reflect all costs (such as lost wages, social and psychological costs).

CAUSE	VT • Total Annual Charges 1998-1999	VT • Average Charge per Hospitalization
Fall	$19.5 M	$11,944
Motor Vehicle Crash	$9.7 M	$21,174
Poisoning	$2.6 M	$5,792
Suicide Attempt	$2.2 M	$6,515
Fire/Burn	$667,000	$15,882
Assault	$597,000	$9,797
Firearm	$438,000	$23,049

Leading Injury Hospitalizations
Per 10,000 Vermonters (1993-1999)



Preventing injuries costs far less than treating them. For example, each dollar spent on smoke alarms saves $69 in medical treatment costs. A dollar spent on bicycle helmets saves $29, one spent on child safety seats will save $32, and one spent on poison control will save $7.

Prevention Strategies

There are three general strategies for preventing injuries. Education can inform people of the risks of their own behavior. Legal and administrative rules can be implemented to prevent high risk activities or institute safeguards. And the incidence of injury can be reduced transparently through improvements in product and environmental design.

Child safety seats are an example of all three strategies used together. Child restraints are engineered to provide maximum protection in a crash. State law requires all children under age 5 to ride in a federally-approved restraint system. And educational efforts are working to instruct parents on their proper use. There are many such examples.

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This *Vermont Injury Prevention Plan 2001* does not address all categories of injury. The areas highlighted here—motor vehicle crashes, violence, falls and hip fractures in the elderly, residential fires, and work-related injuries—were chosen based on analysis of the relevant data, the feasibility of developing successful approaches, and Department of Health priorities as outlined in *VT Health Plan 1999: A Call to Action* and the goals and objectives in *Healthy Vermonters 2010*.

Areas likely to be addressed in future injury prevention plans include poisoning, drowning, bicycle and pedestrian injuries, childhood falls, and physical abuse of the elderly and disabled.

prevent motor vehicle crash injuries & deaths

Motor vehicle crashes are the leading cause of death due to injuries in Vermont, and the leading cause of death from all causes for children. More than 90 people are killed on Vermont's roadways every year. This number has been declining over the past few decades, due to the design of safer vehicles and roads, increased use of safety restraints, and lower tolerance by society of dangerous behaviors such as drinking and driving. Still, approximately 66 percent of people killed in crashes in Vermont were unrestrained; an estimated 38 percent of fatal crashes involved alcohol.

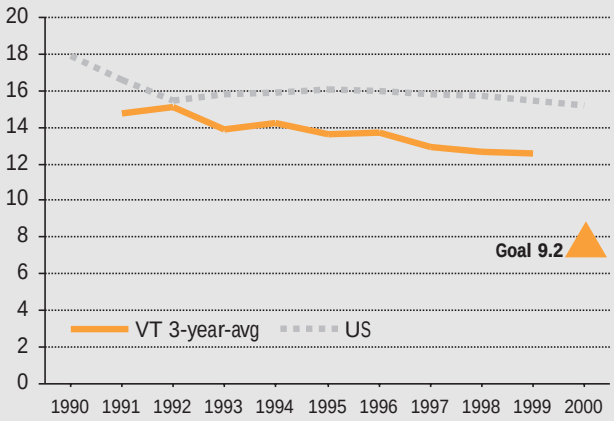
Buckle Up for Life

Vermont law requires that all motor vehicle drivers and passengers use a safety belt or other age-appropriate protective equipment, and for good reason: Safety belts have saved the lives of more than 100,000 Americans over the past 20 years.

Research shows that lap/shoulder belts, when properly used, reduce the risk of fatal injury to front seat motor vehicle occupants by 45 percent, and the risk of moderate to critical injury by 50 percent.

Proper use and positioning of child safety seats reduces the risk of fatal injury by 69 percent for

Motor Vehicle Crash Deaths
Per 100,000 people



children younger than 12 months old, and by 47 percent for 1- to 4-year-olds. Children ages 4 to 8 are generally too small for an adult seat belt. However, only about 6 percent of children in this age group ride in booster seats, the recommended safety seat for them.

Unfortunately, safety seat use drops off after age 4, and trained safety seat technicians find misuse or improper use in the great majority of seats they inspect.

Vermont has come a long way in increasing safety belt use over the past two decades. In 1985, only 18 percent of Vermonters were observed to be buckling up. By 2000, 62 percent of adults observed were using their seat belts.

Primary Enforcement

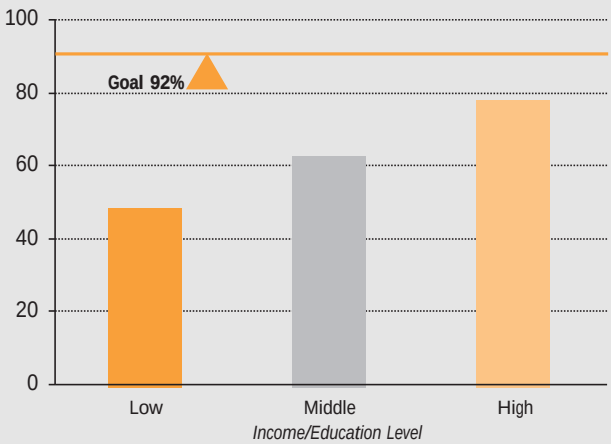
Safety belt use rates are higher in states with standard (primary) safety belt laws, averaging 17 percentage points higher than in states with secondary enforcement laws. A standard law allows law enforcement officers to stop motorists for observed violation. Vermont currently has secondary enforcement. This means that a motorist can be stopped for a burned-out tail light or an expired license tag, but not for violating the state's safety belt law.

The Role of Alcohol

In Vermont, up to 40 people die each year, and hundreds more are injured in motor vehicle crashes involving alcohol. According to Vermont Adult Behavioral Risk Factor Survey data, there were an estimated 300,000 episodes of drinking and driving during 2000. Crash data show that the problem of alcohol-impaired driving occurs throughout the state.

Alcohol-impaired drivers are typically male, and between 18 and 34 years old. Evening and late night are the riskiest times to be on the road. Nearly 60 percent of alcohol-related crashes happen between 6 p.m. and 2 a.m. Drinking-driving behavior often starts at an early age. While the percentage of students who say they "drink and drive" has declined in recent years, it is still far too high. According to the 2001 Vermont Youth Risk Behavior Survey, 16 percent of young people drink and drive, and 24 percent ride as passengers with a drinking driver. ■

Seatbelt Use by Income/Education
Percentage of Vermont adults age 25-64 who always use a seat belt (1993, 1995, 1997)



Safety Belts: Increase the percentage of people who always use safety belts.

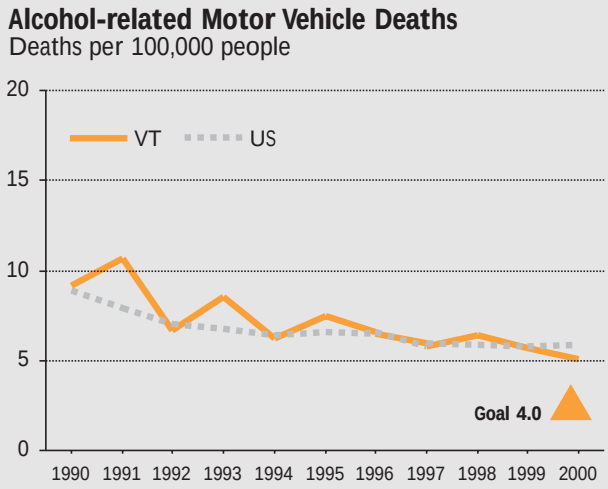
2010 Goal	*92%*
VT 2000 (age 18+)	62%
US 1998	69%
VT 2001 (grades 8-12)	79%
US 1999 (grades 9-12)	84%

Child Safety Restraints: Increase the percentage of children using age-appropriate child restraints and seated in the correct position in a motor vehicle.

2010 Goal	*100%*
VT	unknown
US 1998 (age 4 and younger)	92%

Drinking & Driving: Reduce alcohol-related motor vehicle deaths (as measured by deaths per 100,000 people).

2010 Goal	*4.0*
VT 2000	5.1
US 1998	5.9



Increase Passenger Restraint Use

Action Step 1: Educate law enforcement officers, employers, insurers, driver trainers, judges, etc. about the effectiveness of safety belts.

Action Step 2: Raise public awareness about the importance of using safety restraints.

Action Step 3: Review current state policies and legislation and outline potential options for strengthening seatbelt and child passenger restraint laws to reflect National Highway Traffic Safety Administration recommendations.

Action Step 4: Support community education and training about child passenger safety issues.

Action Step 5: Support community programs to provide car seats and booster seats to low income families.

Action Step 6: Work with emergency medical services, law enforcement, and medical examiners to improve safety belt use data collection.

Decrease Prevalence of Drinking and Driving

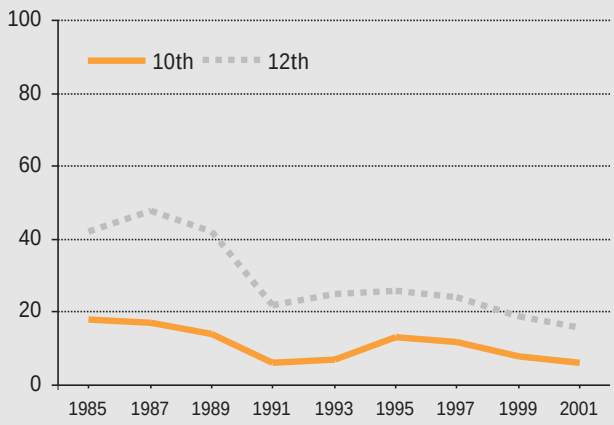
Action Step 1: Raise awareness about the risk of drinking and driving.

Action Step 2: Promote and publicize locally-sponsored sobriety checkpoints.

Action Step 3: Promote adoption of SHARP (Safe Highways Accident Reduction Program) and START (Stop Teen Alcohol Risk Teams) efforts in more local communities.

Action Step 4: Review current state policies and legislation and outline potential options for strengthening blood alcohol testing for drivers involved in serious motor vehicle crashes.

Youth Drinking & Driving by Grade
Percentage of Vermont students in grades 10 and 12 who drove when they had been drinking alcohol

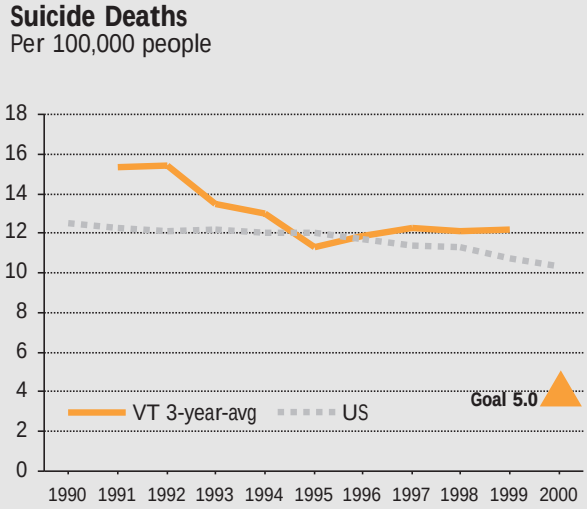


prevent violence

Suicide, physical assault, child abuse, elder abuse, rape, sexual assault and domestic abuse are all intentional acts of violence. Violence is defined not only by such physical acts, but also by violent threats or psychological/emotional abuse. Intimidation, hazing and bullying are forms of psychological and emotional abuse.

A person's tendency to try to solve problems with violence may take root early in childhood, especially among boys. The 2001 Vermont Youth Risk Behavior Survey reveals that 29 percent of students in grades 8 through 12 were in a physical fight during the past year. Fighting is more common among young students, and boys are twice as likely as girls to have been in a fight.

The survey also showed that 13 percent of male students carried a weapon such as a gun, knife or club on school property during the previous 30 days. Overall, 4 percent of students missed at least one day of school because they felt unsafe, and 7 percent reported being hit, slapped or physically hurt by their boyfriend or girlfriend.



Cultural Solutions

Violence is a complex, culturally embedded problem. Preventing violence will require an intensified and coordinated approach among public health, criminal justice, mental health, social service, education professionals and others.

Because firearms are the mechanism of death in most suicides and homicides in Vermont, short-term solutions must focus on reducing firearm violence.

Long-term solutions will involve broader issues of social equality, developmental assets, and a connection to one's community.

Suicide

Suicide is the eighth leading cause of death in Vermont and across the nation. In this country, more people die from suicide than from homicide. On average, 84 Americans commit suicide each day. An average of 73 Vermonters commit suicide each year. While women are about twice as likely as men to attempt suicide, men are nearly five times as likely to die in the attempt.

Suicide is a serious problem among Vermont's young people. It is the third leading cause of death for 10- to 14-year-olds, and the second leading cause for 15- to 34-year-olds. Young people who are at greatest risk often have clinical depression. They may also exhibit behavior problems including drinking and drug use.

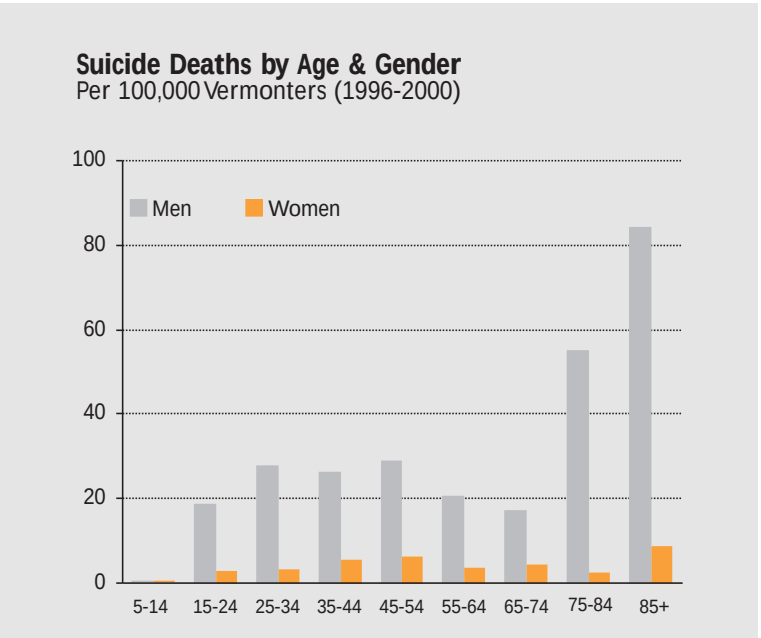
According to the 2001 Vermont Youth Risk Behavior Survey, 13 percent of students in grades eight through 12 had made a plan to attempt suicide, 7 percent had actually attempted suicide, and 2 percent had made an attempt that required medical treatment.

Equally troubling is the incidence of suicide among adults, especially men. Risk factors for suicide in adults and the elderly include recent divorce, separation, unemployment, depression, alcohol or other drug abuse, serious medical illness, living alone, and recent bereavement. Nationally and in Vermont, suicide rates are highest among people age 65 and older.

Firearms are the most common method of suicide, followed by poisoning and suffocation. Vermont has the highest firearm-related suicide death rate of all six New England states.

Child Abuse

Compared with the rest of the nation, Vermont's rate of child neglect is lower, but the rate of child sexual abuse is higher. Vermont's 2000 Child Abuse and Neglect Report revealed that social workers investigated 2,604 reports, 38 percent of which were substantiated. In addition to their physical injuries, children who are abused are more likely to develop mental health problems, aggressive behavior, and learning disorders.



They are also more likely to have problems with lower academic achievement, drug use, teen pregnancy and delinquency.

Sexual abuse is more common than most people realize. Some surveys show that at least one out of five adult women and one out of 10 adult men report having been sexually abused as a child. In most cases, the abuser is someone the child knows—most often an authority figure the child loves or trusts.

Intimate Partner Violence

Intimate partner violence refers to abuse between current or former spouses and current or former boyfriends or girlfriends. According to national estimates, each year approximately 1.5 million women and over 834,000 men are raped and/or physically assaulted by an intimate partner. This occurs in every segment of society.

Although rates of assault in Vermont are lower than national averages, intimate partner violence is still widespread. The Vermont Network Against Domestic Violence and Sexual Assault estimates that it served 6,955 victims of domestic violence during FY 2000; 6,392 of these victims were women. The Network also estimates that 7,302 Vermont children were exposed to domestic violence during this same period. ■

Suicide Deaths: Reduce suicide deaths (as measured by deaths per 100,000 people).

2010 Goal	*5.0*
VT 2000	12.3
US 1998	10.3

Suicide Attempts: Reduce the percentage adolescents who attempt suicide (as measured by self-reported attempts that require medical treatment).

2010 Goal	*1%*
VT 2001 (grades 8-12)	2.2%
US 1999 (grades 9-12)	2.6%

Child Abuse: Further reduce child abuse (as measured by the number of substantiated cases per 1,000 children under age 18).

2010 Goal	*10.3*
VT 1999	7.5
US 1998	12.9

Intimate Partner Violence: Further reduce physical assaults by intimate partners (as measured by number of cases per 1,000 people 12 years and older).

2010 Goal	*3.3*
VT 1999	3.0
US 1998	4.4

Reduce Suicide and Suicide Attempts

Action Step 1: Promote awareness that suicide is preventable.

Action Step 2: Develop a suicide prevention plan.

Action Step 3: Promote educational efforts to reduce access to lethal means, such as firearms, drugs and poisons.

Action Step 4: Support community training for recognition of at-risk behavior and referral to effective treatment.

Action Step 5: Promote screening for depression/suicidal risk among people receiving care in health care settings, emergency departments, specialty mental health and substance abuse treatment centers.

Action Step 6: Support increased access to and community links with behavioral health serivces.

Action Step 7: Improve data collection on suicide attempts.

Reduce Child Abuse

Action Step 1: Promote education and other support services for new parents and families at risk.

Action Step 2: Support public awareness initiatives about child abuse and neglect (e.g. shaken baby syndrome).

Action Step 3: Support programs and treatment for abused children to minimize long-term effects of abuse.

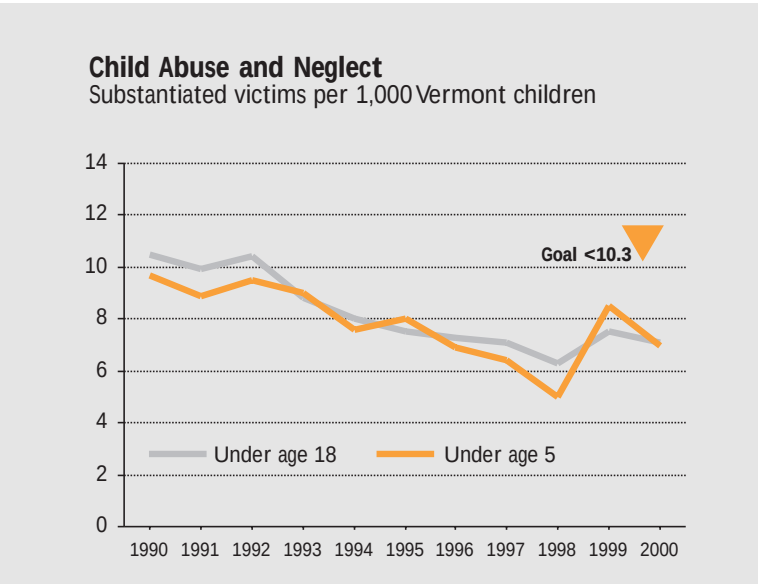
Action Step 4: Promote training for children and young adults to teach safety and self-protection skills.

Action Step 5: Support community programs that insure early identification, referral and support for high-risk children (e.g. children who witness domestic violence).

Reduce Physical Assault by Intimate Partners

Action Step 1: Support community services for victims and perpetrators and their children.

Action Step 2: Encourage health care providers to screen for domestic violence and provide information on community resources.



prevent falls & hip fractures in the elderly

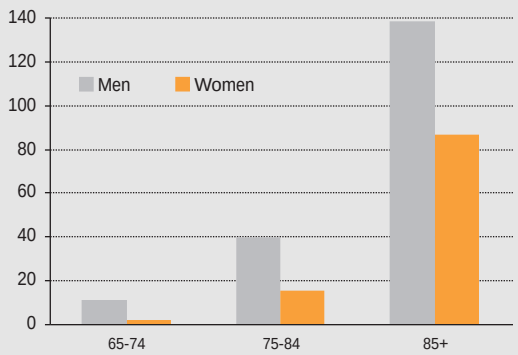
In the U.S. every year, one of every three adults age 65 and older suffers a fall. It is the most common cause of injuries and hospital admissions for trauma among older adults. For the elderly, falls account for 87 percent of all fractures, and are the second leading cause of spinal cord and brain injury.

For adults 65 years and older, 60 percent of fatal falls happen at home, 30 percent occur in public places and 10 percent occur in health care institutions.

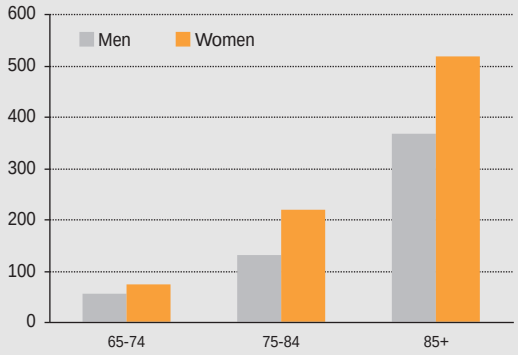
Physical factors that contribute to falling are the problems of the elderly: problems with gait and balance; neurological and musculoskeletal disabilities, use of multiple medications or psychoactive medication, dementia, poor eyesight, and footwear with thick soft soles.

Environmental causes include slippery surfaces, uneven flooring, poor lighting, loose rugs, unstable furniture, and objects left on the floor.

Fall Deaths by Age & Gender
Per 100,000 Vermonters (1996-2000)



Fall Hospitalizations by Age & Gender
Per 10,000 Vermonters (1990-2000)



Hip Fractures and Women

Of all fall-related injuries, hip fractures cause the greatest number of deaths, and lead to the most severe health problems. Women sustain 75 to 80 percent of all hip fractures. People who are 85 years or older are 10 to 15 times more likely to experience hip fractures than are people between the ages of 60 and 65. Most patients with hip fractures are hospitalized for about two weeks, and half of all older adults hospitalized for hip fractures cannot return home or live independently after their injuries. Due to the aging of the population, the problem of hip fractures will likely increase substantially over the next four decades. ■

Fall-related Deaths: Reduce fall-related deaths for adults 65 years and older (as measured by deaths per 100,000 people).

2010 Goal	*to be determined*
VT 1997-99	27.5
US 1999	29.9

Fall-related Injuries: Reduce fall-related nonfatal injuries for adults 65 years and older (as measured by hospital discharges per 100,000 people).

2010 Goal	*to be determined*
VT 1997-99	1,581
US 1998	unknown

Hip Fractures: Reduce hip fractures among adults age 65 years and older (as measured by hospital discharges per 100,000 people).

	Women	Men
2010 Goal	*416*	*474*
VT 1997-99	994	541
US 1998	1056	593

Reduce Fall-related Deaths and Injuries Reduce Hip Fractures among Older Adults

Action Step 1: Promote supervised best elder exercise programs that build strength, balance and coordination.

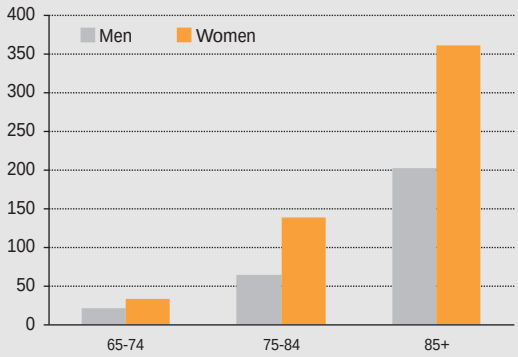
Action Step 2: Promote regular access to vision and hearing screening for older adults.

Action Step 3: Promote nutrition screening and education to prevent osteoporosis.

Action Step 4: Support community programs to provide education and in-home safety assessments to reduce risk of falls.

Action Step 5: Improve fall-related injury data collection.

Hip Fracture Hospitalizations by Age & Gender
Per 10,000 Vermonters (1993-1999)



prevent residential fire injuries & deaths

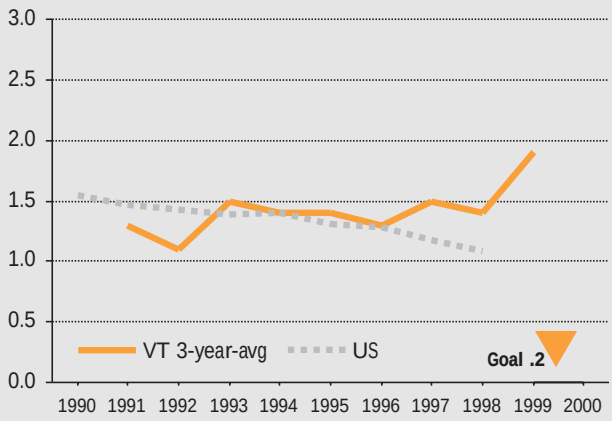
Each year in the U.S., there are millions of fires, resulting in thousands of deaths, tens of thousands of injuries and billions of dollars lost.

The U.S. has one of the highest fire death rates in the industrialized world. Residential fire death rates are highest for children under age 5, and for adults older than 65. Death rates are also high among the poor, the less educated, and those living in mobile homes built before 1976. Hospital discharge data show that from 1993 to 1999, there were more than four hospitalizations for every fire death in Vermont.

Fire Safety at Home

Residential fires occur most often during the winter months of December through February, and are typically caused by cooking and heating equipment. The most common cause of fire-related deaths, however, is smoking materials—cigarettes, cigars, matches, ashtrays, etc. Alcohol also contributes to a large percentage of deaths in residential fires.

On a per capita basis, the fire loss in Vermont over the past few years is among the worst in the country. According to the state fire marshal's report, in the four year



period 1997 to 2000, 65 people died from fire in Vermont. Fires in rental housing claimed the most deaths, with smoking materials being the leading cause of fatal fires. Three firefighters died during that same time period due to fire-related causes. As with the nation as a whole, most of Vermont's losses occur in single and multiple family dwellings.

Despite efforts by the State Fire Marshal's office, Vermont State Police, local fire departments and public health agencies, the fire death rate in Vermont has been increasing. This trend is distinctly divergent from the national fire death rate, which has shown a decrease over the same time period.

Smoke Alarms for Early Warning

Properly placed, working smoke alarms provide residents with enough time to escape nearly every type of fire. When a fire occurs, homes with smoke alarms have half as many deaths. The majority of fire-related fatalities occur while people are asleep (9 p.m. to 6 a.m.), making effective detection and alerting systems especially important. Properly maintained smoke alarms are an inexpensive way to provide early warning of fire and are 50 to 80 percent effective at preventing death or injury. ■

Fire Deaths: Reduce residential fire deaths (as measured by deaths per 100,000 people).

2010 Goal	*0.2*
VT 2000	3.0
US 1998	1.2

Smoke Alarms: Increase functioning residential smoke alarms (as measured by percentage of total population living in residences with functioning smoke alarm on every floor).

2010 Goal	*100%*
VT 1997-99	unknown
US 1998	88%

Reduce Residential Fire Deaths
Increase Use of Smoke Alarms

Action Step 1: Promote widespread and proper installation and maintenance of smoke alarms.

Action Step 2: Educate children and families about fire and burn prevention in the home, including: creating and practicing a home fire escape plan; setting hot water heaters at 120°; and the importance of attending to lit stovetops, ovens and cigarettes.

Action Step 3: Review the condition of rental housing throughout the state to determine the level of fire safety provided to low-income tenants.

prevent work-related injuries

Vermont's Work Record

Vermont's rate of work-related injuries has not improved significantly since the 1980s. There are about 25,000 worker compensation claims filed in Vermont each year. Since many worker injuries are not reported or not recognized as work-related, the total number is likely to be much greater.

The leading causes of work-related fatalities in Vermont are motor vehicle crashes and machine-related incidents. Nationally, nonfatal injuries on the job are most often caused by contact with dangerous objects or equipment, overexertion and bodily reactions, and falls. Younger workers, especially young men, have the highest rates of work-related injuries. However, there are health and safety hazards in most workplaces and as a consequence, many young workers are injured or killed on the job each year. ■

Most adults spend about a quarter of their time at work. Although there is great variety among the types of work and work settings, issues like injury prevention, exposure to toxic substances and allergens, and work-related disorders are common health concerns.

According to the most recent report from the National Institute of Occupational Safety and Health, about 13 Vermonters died each year from 1980 to 1995 as a result of injuries related to their occupation. The state's average annual rate of fatal workplace injuries was 4.4 deaths per 100,000 people, below the national average of 5.2.

Work-related Injuries: Reduce work-related injuries resulting in medical treatment, lost time from work, or restricted work activity for full-time workers age 16 and older (as measured by injuries per 100 workers).

2010 Goal	*4.3*
VT 1999	6.9
US 1998	6.2

Reduce Work-Related Injuries

Action Step 1: Improve surveillance and reporting systems to track work-related injuries.

Action Step 2: Encourage the implementation of worksite programs to increase safety belt use among employees.

Action Step 3: Promote efforts to educate employers and employees about appropriate precautions and changes in work practice to improve safety and prevent injuries.

Action Step 4: With assistance from VOSHA, encourage employers to develop violence prevention programs in the workplace.

References

VT Department of Health
VT Health Plan 1999: A Call to Action
Burlington, VT 1999.

Healthy Vermonters 2010
Burlington, VT September 2000.

Institute of Medicine
Reducing the Burden of Injury: Advancing Prevention and Treatment. National Academy Press, Washington, DC 1999.

U.S. Department of Health & Human Services
Healthy People 2010 2nd Ed. With Understanding and Improving Health and Objectives for Improving Health (Two Volumes). Washington, DC November 2000.

Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. *Injury Fact Book 2001-2002.* Atlanta, GA 1999.

Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. *A Tool to Prevent Senior Falls.* Atlanta, GA 1999.

U.S. Department of Transportation
National Highway Traffic Safety Administration. *Standard Enforcement Saves Lives: The Case for Strong Seat Belt Laws.*

Data Sources

VT Department of Health
- Vermont Behavioral Risk Factor Surveillance System
- Vermont Vital Statistics System
- Vermont Hospital Discharge Data
- Vermont Youth Risk Behavior Survey

VT Department of Labor & Industry
VT Department of Public Safety
VT Department of Social & Rehabilitation Services